IRRIGATION FOR MAXIMUM RETURNS

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THE NUMBER of irrigations and the amount of water applied at each irrigation affect sugarbeet yields and net returns from fertilizer investments. Early in the season, light irrigations should be applied to maintain good soil moisture in the root zone of the seedlings. The frequency of irrigation will depend on climatic conditions and rainfall that occurs.

After about July 15, the root system has expanded and heavier irrigations can be given. However, excessive irrigations can result in lower yields unless extra nitrogen is applied to compensate for the leaching of soluble nitrates from the soil. Additional nitrogen is generally required to obtain comparable yields when irrigations are not carefully controlled.

Experimental data obtained at the Snake River Conservation Research Center and summarized in the following table indicates that an 0.5 to 1 ton per acre yield decrease may occur when irrigation water is not carefully controlled and the nitrogen level is not high.

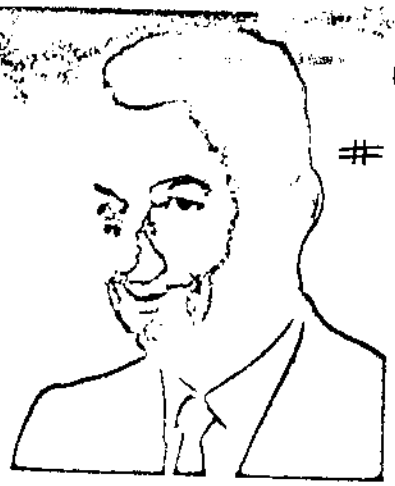
With high rates of nitrogen fertilizer, top growth was increased, but root and sugar yield generally were not increased. In this study, the plots were irrigated when tensiometers placed at the 18-inch depth indicated that the soil moisture tension had reached 0.65 atmosphere except for the first few irrigations.

The M_1 level was irrigated using alternate furrows in 12-hour sets after July 1. The M_2 level was irrigated at the same time and also with alternate furrows, but the duration of the set was 24 hours. The frequency of irrigation for the two years from July 15 to August 31 ranged from 10 to 11 days. During this period, evapotranspiration removed about 0.3 inch of water per day from the soil. After September 1, the plots were irrigated at an average interval of 12 to 14 days. The time between irrigations was longer after September 1 because evapotranspiration decreased as solar radiation and air temperatures decreased. More frequent irrigations on similar soils after July 15 might result in more top growth and a need for more nitrogen, but yields probably would not be affected materially.

The irrigation frequencies given may vary somewhat from year to year depending on climatic conditions and rainfall. On sandy soils the interval between irrigations must be shortened several days. These schedules will generally result in optimum yields with a minimum number of irrigations and a minimum nitrogen fertilizer requirement. ■

Yield of Sugar Beets on Portneuf Silt Loam as Affected by Irrigation Levels (M_1 and M_2) and Fertilizer Applied (Twin Falls, Idaho).

Nitrogen Applied	*Yields at moisture levels of —*					
	1966		1967		Average	
	M_1	M_2	M_1	M_2	M_1	M_2
lbs./acre	*tons/acre*		*tons/acre*		*tons/acre*	
0	22.5	24.3	25.3	22.0	23.9	23.2
100	25.5	24.2	24.7	23.4	25.1	23.8
150	24.6	25.7	23.5	23.6	24.0	24.7
200	24.9	26.6	23.9	23.8	24.4	25.2



DR. JOHN S. McFARLANE, now on temporary duty at the U.S.D.A. Plant Industry Station in Beltsville, Md., was recently named Leader of Sugarbeet Investigation in the Agricultural Research Service of USDA, responsible for research programs in cooperation with state, industry and other federal agencies in U. S. sugarbeet producing areas.

Dr. McFarlane has a B.S. degree from Montana State University and a Ph.D. degree from the University of Wisconsin (1943). In 1946 he joined Sugarbeet Investigations and worked at Salt Lake City with the late Dr. F. V. Owen. He moved to the U. S. Agricultural Research Station, Salinas, Calif. in 1947 where his research aided the development of sugarbeet breeding lines and varieties adapted to the West Coast area. Most recent research product was a monogerm variety with resistance to bolting, curly top and virus yellows.

Dr. McFarlane has published over 50 scientific papers on sugarbeet breeding; in 1966 he received the Meritorious Service Award from the American Society of Sugarbeet Technologists. He is a Fellow in the American Association for the Advancement of Science, and was a participant in the USDA Superior Service Award for developing the monogerm sugarbeet.